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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,192	02/01/2002	Silviu Borac	MENT-062	9408

7590

04/19/2004

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EXAMINER

NGUYEN, KIMBINH T

ART UNIT	PAPER NUMBER
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2671

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DATE MAILED: 04/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/062,192

Applicant(s)

BORAC, SILVIU

Examiner

Kimbinh T. Nguyen

Art Unit

2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-156 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,53-59 and 105-111 is/are rejected.
- 7) ☒ Claim(s) 8-52,60-104 and 112-156 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to amendment filed 1/30/04.
2. Claims 1-156 are pending in the application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7, 53-59, 105-111 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levin "Interpolating Nets of Curves By Smooth Subdivision Surfaces", ACM 1999, pages 57-64 in view of Lounsbery (6,553,337).

Claim 1, Levin discloses a mesh representation comprising points, referred to as vertex, connected to neighbor points by edges, the feature (mesh) being defined in connection with vertex and neighboring points and the edge (fig. 2, section 2, page 58); generating a weight vector based on a parameterized subdivision rule defined at levels for which a value of parameter differs at two levels in the mesh (each edge is shared by exactly two faces as parameterized by u and v parameters; see fig. 2, section 2 and 3 page 58); using weight vector (every c-vertex which is associated with a parameter value u on the curve c, has associated with a 3D vector d(v) which determines the second partial derivative of the limit surface at the point c(u) in the cross-curve direction

by the subdivision process; see section 3, page 59) and position of the vertex and neighboring points to generate the representation (for each old vertex v , make a new vertex-vertex $v(v)$ at the point given by the linear interpolation). Levin teaches generating a weight vector based on a parameterized subdivision rule but does not teach a parameterized subdivision rule defined at levels for which a value of parameter differs at two levels in the mesh; however, Lounsbery teaches a parameterized subdivision rule defined at levels for which an arbitrary constant value of parameter differs at two levels in the mesh (col. 5, lines 9-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a method for parameterizing a subdivision mesh in a computer system taught by Lounsbery into the Catmull-Clark's Subdivision Scheme of Levin's method for smoothing subdivision surface, because it is often desirable to have smooth transitions of parameter values when moving from one position on a subdivision surface to another (col. 1, lines 60-63). Further, **Claim 2**, Lounsbery discloses values of parameter that differs at two levels are related by a selected mathematical function (col. 5, lines 9-37). **Claims 3-5 and 7** Levin discloses the feature is a smooth feature line; the smooth feature line is defined in connection with vertex and two neighboring points and edges (section 2, page 58), the weight vector having a parameter value associated with edges along the smooth feature line is defined; the weight vector to make use of parameters associated with the edges along the smooth feature whose values are defined the same, whose values differ (for each old edge e , make a new edge-vertex $v(e)$ as the weighted average of the old vertices of e and the new face vertices associated with the two faces original sharing e .

The weights W_n (which are the same as the weights used in rule 1) depend on the valency n of each vertex; see section 2, page 58; fig. 2).

Claims 53-57, 59, 105-109, 111, the rationale provided in the rejection of claims 1-5 and 7 is incorporated herein.

Claims 6, 58 and 110, Levin teaches the parameters that are related to a subdivision rule reflects a sharp crease along the edges which the smooth feature line is defined (see conclusions, page 61).

Allowable Subject Matter

5. Claims 8-52, 60-104, 112-156 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not teach the parameters that are related to a subdivision rule reflects a sharp crease along the edges which the smooth feature line is defined, the values of parameters being defined in the interval $[0,1]$, where higher values define a sharper crease, the values of the parameters at lower level being related to the values at a higher level related by the claimed equations.

Response to Arguments

6. Applicant's arguments with respect to claim 1 has been considered but are moot in view of the new ground(s) of rejection.

The rejection of claims 1-7, 53-59, 105-111 has been modified in this Office Action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kimbinh Nguyen** whose telephone number is **(703) 305-9683**. The examiner can normally be reached **(Monday- Thursday from 7:00 AM to 4:30 PM and alternate Fridays from 7:00 AM to 3:30 PM)**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

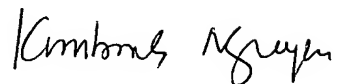
Hand-delivered responses should be brought to Crystal Part II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

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Art Unit: 2671

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A handwritten signature in cursive script, appearing to read "Kimbinh Nguyen".

Kimbinh Nguyen

Patent Examiner AU 2671